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ABSTRACT

Individualized instruction and the associated accountability mean more documentation for teachers. How can teacher productivity be increased to handle the heavier workload? The solution for the Jacqueline Vaughn Occupational High School, a special education school in Chicago, was a networked local school computer linked to each teacher's personal computer. The networked computer stored the shared, character-based documents covering most aspects of each student's education. This paper discusses: (1) fundamental problems with paper-based systems for monitoring a student's education; (2) how a project to provide a solution was launched; (3) computer-based methods for creating student documentation, including Individual Education Plans (IEPs), Multi-Disciplinary Conferences (MDCs), Transition Planning Guides (TPGs), class/service/activity enrollments, job descriptions, anecdotal notes, and behavior referrals; (4) teacher communication tools, including electronic mail, school and personal calendars, announcements, and correspondence with parents; (5) assessment of the solution's impact during 2 years of experience at one school; and (6) considerations for other school districts, including funding priorities, teacher culture, computer system integration, cost justification, goal individualization, and special education issues. The paper concludes by noting that the "comprehensive monitoring" technology is here and that the technology helps both staff and parents manage a student's education, and that if schools are willing to deal with the consequences of more individualized instruction and greater accountability, they should pursue this type of program. (LPP)

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Comprehensive Monitoring of a Student's Activities

Donald F. Rubovits & Jay F. Mulberry ■

Abstract

Individualized instruction and the associated accountability mean more documentation for teachers. How can teacher productivity be increased to handle the heavier workload? The solution for the Jacqueline Vaughn Occupational High School, a special education school in Chicago, was a networked local school computer linked to each teacher's personal computer. The networked computer stored the shared, character-based documents covering most aspects of each student's education. This paper discusses: (1) fundamental problems with paper-based systems for monitoring a student's education; (2) how a project to provide a solution was launched; (3) computer-based methods for creating student documentation, including Individual Education Plans (IEPs), Multi-Disciplinary Conferences (MDCs), Transition Planning Guides (TPGs), class/service/activity enrollments, job descriptions, anecdotal notes, and behavior referrals; (4) teacher communication tools, including electronic mail, school and personal calendars, announcements, and correspondence with parents; (5) assessment of the solution's impact during 2 years of experience at one school; and (6) considerations for other school districts, including funding priorities, teacher culture, computer system integration, cost justification, goal individualization, and special education issues. The paper concludes by noting that the "comprehensive monitoring" technology is here and that the technology helps both staff and parents manage a student's education. If schools are willing to deal with the consequences of more individualized instruction and greater accountability, they should pursue this type of program.

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Introduction

The technology we are presenting has helped manage operations at a small high school for the past 2 years. The direct users of the technology are the teacher and support staff, not the student. Its relevance to this family-oriented conference: what's good for the teacher is good for the family. Our experience is that the comprehensive monitoring the technology supports is rare. Thus, we hope to make more of the education community aware that this technology is available today.

The Technology

The "technology" is a networked computer system for managing a school's operations. It runs a software package called DOC-FLOW™, a product of WorkFlow Incorporated. Every teacher and most of the support staff have their own personal computers. All are linked to the school's local computer that stores the shared database covering many facets of school operations. The computer system is specifically designed for teachers and provides a variety of tools. Tools include: (1) electronic folders and documents covering most aspects of both a student's individual activities and a staff person's responsibilities, (2) aids for recording information, (3) methods to monitor the flow of paperwork, and (4) electronic mail (e-mail). Besides handling formatted data such as names, numbers, and dates, this system is particularly well suited for unformatted variable-length information such as evaluations, goals, anecdotal comments, and ideas.

Benefits

The tools make it easier for teachers to do certain parts of their administrative work. Furthermore, they provide the school with a structure that fosters good documentation. And with immediate access to readable (i.e., *not* handwritten) documentation on the student, a teacher can learn quickly the

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individual student's needs. As for parents, they have the right to view their child's records. They do not have to struggle with reading handwritten documents. The greatly expanded documentation of the school's relationship with their child enables them to make more appropriate suggestions to school staff. This capability is to education what an asset portfolio is to a financial planner . . . you have to know where you stand today to make good decisions for the future.

Definition of the Problem

Problems Inherent with Manual, Paper-based Systems

Two factors are creating pressure on schools for more documentation on each student:

- Advocates of high-quality education promote smaller class size and the associated individualized instruction. Unfortunately, individualized instruction requires more documentation.
- Grades and test scores are the traditional bases for accountability. They are easy to process, but many question their effectiveness for measuring success in learning. Any alternative will require more documentation.

The special education world calls the added documentation an Individual Education Plan (IEP). For regular education, the National Association of Secondary School Principals (*Breaking Ranks: Changing an American Institution*) calls it the Personal Plan for Progress. In both worlds, the documentation is based on goals and the reports on progress in meeting the goals. These reports take more teacher time to prepare than simple grades. What are the implications of added documentation that is paper based?

Creating Added Documentation. Goal and progress information includes at least the student's name, name of class or related service, date, and the author's identification. Many paper forms require considerably more descriptive information, most of which is simply copied from other records. Furthermore, many of the goals for students in the same class can be common. Finally, goals and progress are narrative information; they require editing. Manual methods for performing these tasks are painfully inefficient when compared to computer methods.

Updating Added Documentation. The maintenance of mandatory paper documents requires significant filing, retrieving from files, and re-filing. Those tasks can be particularly frustrating for teachers, who typically are under a constant barrage of demands on their time. The level of frustration can be so high that filing may be delayed or even never done.

Sharing Added Documentation. A number of different staff persons create information for and about a given student. If no other staff needed to read the author's documentation, private files would be sufficient. However, synergy among staff occurs only when information on students is shared. Methods for sharing dispersed pieces of paper simply are inefficient and ineffective.

Reading Added Documentation. Once accessed, the legibility of handwritten documents can be a major problem. Poor handwriting consumes extra staff time because it takes longer to read. At worst, a staff person may be deterred from even trying to read it.

Accountability. Some teachers are good documenters, and they document. Other teachers aren't and don't. And then there is everything in between. Thus, the quality of the documentation is uneven. To assure general compliance with school policy, someone besides the author has to conduct a review—whether peers or administration or both. But just as staff members need access to documentation for normal operations, they also need access for quality assurance purposes. If the documents are on paper, their collection and return are disruptive and expensive.

These fundamental problems are exacerbated with more voluminous documentation. Failure to alleviate them probably guarantees that the type of individualized instruction and accountability envisioned are unattainable.

How the Administrative Technology Project Started

Jacqueline Vaughn Occupational High School, in the Chicago Public School system, has 170 special education students between the ages of 14 and 21. They take appropriate classes, receive related services, work in school and commercially, and prepare for independent living after graduation.

The school had been using computers in the classroom for several years to help teach. Also, a few staff used computers as word processors. Starting in 1991, the principal targeted two complex processes for re-engineering:

- The process for creating and using IEPs. As a special education school, its most important document is the IEP. Annually, a multidisciplinary team prepares a new one for each student. Subsequently, those responsible for supporting the goals write periodic progress reports.
- Administration of teachers' nonteaching workload. Outside teaching itself, teachers are harried by both classroom administration and schoolwide responsibilities. These tasks require extensive sharing of information, documentation, and follow-up.

The school district's computer system for special education served all schools in the district. It monitored compliance with district procedures. It provided only limited day-to-day help for Vaughn's teaching staff. Consequently, school district headquarters funded the writing of a 75-page specification for a comprehensive computer system to help local school staff do their daily administrative tasks. A computer would be placed in the local school and would store the special education documentation required for each of its students. The final specification reflected extensive staff interviews and collaboration. While the original focus was on IEPs, it expanded into many documents and procedures.

Documentation on Students

Student Programs

Classes. The school offers a variety of classes. Enrolling a student in a class automatically creates a separate electronic folder that includes the schedule and location; an initial draft of a goal document (a carbon copy appears in the IEP folder); and room for anecdotal notes, behavioral records, and letters home. The classroom teacher can browse easily through the individual folders for the students in a class, updating each as required.

Related Services. Various specialists visit the school regularly to provide services to individuals and small groups. Services include psychological testing, speech therapy, nursing, hearing support, vision support, and occupational therapy. The school counselor, school social worker, and visiting psychologist lead group counseling sessions. These specialists submit via the computer system the evaluations required in the annual IEP and the triennial planning forms. Also, they record progress in meeting goals and other information appropriate for sharing.

Work Program: In-house Work. Supervised by school staff, students clean the building, prepare food in the cafeteria, operate office equipment, landscape neighbors' yards, and shovel snow off neighbors' walks in the winter.

Work Program: Commercial Work. Staff on a part-time basis manage the commercial work program. They recruit employers, prepare students for interviews, counsel students, maintain regular phone contact with employers, and visit job sites.

The work program administrators can record relevant information in the computer about each job and field work assignment. They also can keep electronic records of the school's relationship with each commercial employer. The computer system tracks interview schedules, job progress, site visit schedules, as well as events promoting good employer relations.

Transition Program. A coordinator plans and tracks activities the school undertakes to smooth a student's transition to life after graduation. They include such things as overseeing enrollments in programs run by state agencies. These activities start when the student enters the school. The transition coordinator stores in the computer system the descriptions of the activities, names of the responsible staff, and the activities' status. The computer system prints the information as the Transition Planning Guide (TPG), a formal special education document.

Admissions

Vaughn attracts applicants from many parts of the city who must meet certain criteria before being accepted. The admission coordinator can record essential information in separate electronic folders for each applicant. The system tracks the admissions process.

Inclusive Activities

Vaughn has admitted only special education students. To develop relationships with nondisabled peers, the students have participated in a variety of integrated (i.e., "inclusion") activities. They included classes at nearby high schools, a program at a nearby junior college, visits by students from other high schools, field trips, and commercial jobs.

The school staff carefully recorded participation in these integrated activities because they are so critical to the transition to independent living. The computer system subsequently prepares an addendum to the IEP that lists past and current enrollments in them. Also, the computer system prints rosters to help the staff manage the logistics of these activities, most of which require transportation.

Discipline Administration

As soon as behavior incidents are reported, the principal entered relevant information into the electronic folders of the involved students. For complicated cases, other staff added their comments. The entire staff, from security guard to school office staff to teacher, can learn what happened, what disciplinary action has been taken, and what suspensions are in effect.

Case Management

A case manager maintains the staff's focus on each student's individual needs. Among other things, he managed all aspects of the annual IEP conference required for each student, admitted new students to the school, and managed enrollments in classes and services.

A student's education plan is comprised of narratives contributed by a number of staff persons. The IEP document includes at least ten pages of narratives and student data. The triennial Multi-Disciplinary Conference document has three pages. The Transition Planning Guide has six pages. The case manager coordinates the timely preparation of these narratives. The computer system assembles all document components and prints them in the formats specified by the school district.

The timing for the printing of these documents is important. Staff may prepare drafts of their material before the IEP conference. Final judgments are reserved until the conference itself. After discussion among staff, parents, and child, staff members edit their respective narratives to reflect the group's decisions. There are two computers in the IEP conference room for this purpose, and more are available in adjoining offices of the Counseling Center. The final documents are printed on a laser printer also located in the IEP conference room. The meeting ends after the involved parties sign the documents.

Teacher Communications

Private Communication

The system includes e-mail for the entire staff. It allows them to exchange mail both locally at the school and worldwide with anyone connected to the Internet. Although e-mail operates as an independent subsystem, an e-mail message can be copied locally to any electronic folder. For example, a teacher can copy a message about a student to the student's electronic folder. The e-mail thus joins IEPs, goals, anecdotal notes, behavior reports, and letters to parents as part of the "intimate, comprehensive view of the school's relationship with the student."

Personal Features for Each Staff Person

Personal Folders. Each staff person has at least one electronic personal folder. The folders are useful for storing miscellaneous form letters, reminders, notes, and e-mail.

Personal Calendar. Personal calendars for each staff person are integrated into the system. Properly marking any note or e-mail document in any of the electronic folders causes an entry to be included in the document creator's personal calendar. If the need for the document is temporary, the staff person deletes it when the task is completed; otherwise, the document remains as a permanent part of the folder. These notes and important e-mail messages enhance the descriptions of the school's relationships with its students while helping staff organize their time.

Public Communication among Staff

Scheduled Events. The principal and selected staff create a document for every scheduled school event (e.g., holidays, in-service training, local school council meetings, visits by dignitaries, deadlines). The computer system tracks the active school events and displays them as the school calendar for internal use. The school calendar contains only a brief "headline" for each event; the user can read the details by directly retrieving the document from the school calendar screen.

Required Staff Reading. The principal wrote a daily newsletter. Other staff prepared documents to announce special information. Staff members were expected to read them because they were the school's primary, and usually only, method for disseminating general information.

Public Folders. The school has project folders for school rules, procedures for using the computer system, minutes of the Fine Arts Committee, nominations for Student of the Month award, and almost every aspect of the school's operations. They offer a convenient method for storing and sharing information. In effect, they are bulletin boards on topics of special interest.

Letters to Parents and Employers

Parent involvement is critical to school success. Communication with parents is a prerequisite to their involvement. The system makes it easier to send personal letters to parents. The teachers need only enter the text of the letter and modify computer-generated data (parent name, address, teacher's name and title) as required. The teacher can copy even the text itself from other letters and then make changes as needed.

The school office staff has used the "Letter to Parent" feature to produce individualized parent consent forms. The computer system prints with typeset quality the completed letter, including the school letterhead. The electronic version of the letter remains part of the student's folder.

The work program coordinators used a similar capability to send letters to employers. This capability fosters a professional relationship with employers, which is particularly important when supervision of the school's very special students requires joint effort.

Assessment of the System's Impact

Was the computer system hardware and software installed as planned?

- For local school operations: yes. In fact, because the Internet is now connected throughout the school, the system infrastructure is being used for educational as well as administrative purposes.
- Has Phase II of the project—linking the local school computer to the district's mainframe computer—been implemented? Not yet.

Did the staff use the system?

- Essentially 100% of the staff used the system to read the principal's daily newsletter, the daily events schedule, personal e-mail, and in-process behavior referrals (i.e., discipline cases). This level of use came about because the principal discontinued the paper-based newsletter and relied heavily on those means to communicate with the staff.
- The principal personally used almost every feature of the system.
- All teachers prepared class and individual student goals on the system. Visiting specialists providing related services used the system to prepare their evaluations and goals for the IEPs and MDCs. Visiting specialists had to use the system because after 3 months of the 2-year period passed, handwriting of IEPs and MDCs was discontinued.
- Some staff used most of the features, particularly anecdotal notes about students and letters to parents.
- The Case Manager used the system intensively to complete IEPs and MDCs. The Transition Coordinator used the system intensively to prepare TPGs. Other coordinators used less intensively the specialized subsystems designed for them.

Were the fundamental problems resulting from information being on paper alleviated?

- Was documentation created more efficiently? Yes.
- Was documentation updated more efficiently? In the 2 years, we did not reach the goal of professionals working almost exclusively electronically and support staff handling the paper. With more time, selected staff responsibilities can be realigned to reflect the technology and then that goal will be reached.
- Was student documentation shared? Some teachers read some of the electronic documentation; we believe others read it infrequently.
- Was documentation legible? Of course.
- Was documentation available for quality assurance purposes? Yes. Was it accessed for that purpose? Not yet.

Did the quality of the IEP goals improve? Such improvement is hard to demonstrate. Writing goals is an art. We would like to think the efficiency of the system left teachers with more time to improve the appropriateness of the goals they wrote.

Were the IEP conferences with parents run any better? The printing of the IEPs at the end of the conference was certainly impressive.

Were the reports on progress in meeting goals more frequent and of higher quality? A few teachers religiously used the system to report progress frequently.

Were communications improved?

- Between principal and staff? Absolutely.
- Among staff? Sometimes. The nurse announced special accommodations for certain students. The cafeteria manager announced schedules. The school secretary announced that coffee money was due. The Case Manager published IEP staff schedules. Teachers submitted information to the summer school coordinator via documents in public folders. These uses were growing and were being refined frequently.
- Between teacher and parents? Several teachers were using the "Letter to Parents" feature to prepare individual letters to the parents of all students in their classes.

Was traditional classroom management simplified for the teachers? The system specifically excluded attendance reporting and grades because existing districtwide procedures governed those tasks. Did teachers use the Personal Calendar feature? No.

Could the office staff be more responsive to questions? Absolutely. For example, immediately accessible were teacher and student schedules, student addresses and telephone numbers, and which students were on each bus.

Was the objective of "comprehensive monitoring" achieved? Yes, pretty well. After the accumulation of 2 years of data, one can read the electronic folders of many students and have a good idea of what's happening.

Did the system provide a structure for school operations? Yes. We were surprised by the number of staff who lacked a global view of school operations. As a consequence, we devoted more staff training to school procedures than to computer procedures (i.e., which keys you press). The system imposed on them a common way of doing things, and it was clear that it would be easy to review what they did. We believe this impact was one of the most valuable the system provided.

How were operations affected by virtue of the software being new? The software used in this project represented a new version of WorkFlow Incorporated's product, which was in commercial use since 1988. After operations with the computer started, staff made many suggestions. Thus, new features as well as refinements to existing features were added regularly to the system throughout the 2 years. By the end of the 2 years, the set of system features was stable. However, the changes did extend the learning time for some staff.

Was the system reliable? The hardware worked flawlessly. Downtime of the complete system was rare.

Was a comprehensive technology plan developed for the school? Yes.

Considerations for Other School Districts

Funding Priorities

In the education world, almost everything written about technology is directed toward teaching applications, not administrative uses. Reasons for this focus include:

- Education's reason for existence is to equip the student with appropriate skills. Certainly teaching applications should receive priority when competing for technology dollars.
- Many buildings still lack the cabling needed to support schoolwide networks. To obtain the full benefits of this type of administrative system, the school must have it.
- Teachers' interests lie in teaching, not administration.
- Teachers have control over software that runs on personal computers, not software that serves an entire organization.
- School administrators are former teachers and typically have limited experience with multiuser administrative systems.

Those most concerned with administrative systems are usually at school district headquarters. They are consumed with running district-level systems to monitor compliance and secure government funding. Day-to-day problems with local school operations often are not a top priority.

For administrators directed to provide more individualized instruction, teacher productivity becomes an issue. They must explain how existing staff can handle the added documentation. The administrative system is a means. However, to receive funding priority, it must be presented as a prerequisite for the end—individualized instruction.

Teacher Culture

Our experience is that some teachers quickly learn to use the system, while others have major problems. For the latter, the school must commit extra training and support. The job is really not done until the needs of this group are addressed. School leadership also must be sensitive to system design trade-offs between marginal efficiency gains and ease of use. Ease of use should win every time! There is a relatively low limit to what the entire school staff can be expected to learn.

Broad acceptance of a comprehensive system is evolutionary. Some factors critical to a system's success are the principal's personal use of the system, certification of staff to use it, good system support, and ease in changing the system design to handle new school procedures.

Technical Infrastructure

Integrating a new system into existing systems can present formidable technical problems. More than one disagreement has arisen over the best way to do it. Technical staff, in particular, may have agendas covering the gamut of hardware, software, and support. Nontechnical staff should understand that new requirements often appear to be in conflict with these agendas. However, additional design effort may make the two compatible.

System Costs

Computers are expensive. That's why funding organizations are making school technology plans imperative. These plans present the "business case" (i.e., the justification) for projects. Our presentation has been on nonteaching uses. But the same equipment can be used for teaching. How should costs be allocated to the different purposes?

One dimension of the issue is the availability of government funds. They typically are tied to specific objectives. The government does not care if other objectives can be met with the same acquisition, so costs are allocated to the purpose for which the funding is received. In this circumstance, other applications have a "free ride."

Another dimension to the allocation problem is how much should come from the local school budget and how much from a district-level department's budget? For example, one solution is that the local school pay for computer hardware and that the district-level department pay for the software and support.

Yet another dimension of cost is time. There is a definite limit to how much technology a school can absorb at one time; for example, staff responsibilities may be realigned, school procedures changed, and staff trained. Thus, the issue is not only how much the technology costs, it is also how fast it can be implemented realistically. By extending the implementation interval, the funding may be easier to obtain.

For software of the type we have described, the initial cost can easily run $50,000 for a single school. Understand that this cost includes planning, configuration, installation, and training. Ongoing support costs can amount to 15% to 20% of the initial cost. A small school with a staff of 25 would spend initially $2,000 per staff person and annually thereafter $400 per staff person. If a district installs the system at multiple schools, the cost per school becomes less.

Information Week (9/22/97, p. 42) reports that companies may spend on computers between $15,000 and $1,500 per employee per year. Computer firms and banks spend at the high end; food-processing companies spend at the low end. From one frame of reference, school expenditures can be compared to food-processing company expenditures. Note that computer hardware is an integral part of the teaching process and is comparable to the machinery in a food-processing plant. Since the $1,500 annual expenditure in the food-processing companies does not include machinery, computer hardware in the local school can be excluded from this comparison. With this logic, a school spending $2,000 initially and $400 annually is in line with a food-processing company spending $1,500 annually.

Another frame of reference would be to compare what is spent on computers at district headquarters with what is spent on administrative software at local schools.

Special Education Practices

The special education world has procedural safeguards to assure their students receive what is due them. For example:

- They can't use "boilerplate" (produced on a copier) goals.

- They can't conclude anything in advance of the IEP meeting.
- IEPs must be kept secure to maintain their confidentiality.

Professionals have told us that these safeguards preclude using a computer for IEPs. We believe that conclusion is wrong because it does not distinguish between means and ends.

One end is that an IEP reflect the synergy emanating from an annual multidisciplinary staff meeting with the parents. Whether the documentation is prepared with a pen or a keyboard is irrelevant; both are a means. In both cases, a piece of paper is produced and signed by all relevant parties. Regardless of the preparation technique, staff members are ultimately responsible for the appropriateness of specific goals for the student and the efforts to achieve them.

Another end is confidentiality. The traditional means for achieving that end is locking all the information in a filing cabinet. Another means is to store it on a shared computer that has appropriate security features. Confidential data have been maintained on computers in the business world for 35 years. Computers can restrict access only to authorized staff. What about a social worker's personal notes? If data are not meant to be shared, they should not be stored on a shared computer.

Conclusions

This paper explained in some detail how technology can help teachers manage their tasks. While it described the experiences of a special education school, it applies to any school committed to more individualized instruction.

Our messages to families and school administrators alike are these. The "comprehensive monitoring" technology is here. It's relatively easy to replicate. Depending on your priorities, it's affordable. It gives structure to a school's operations. It improves communications. It collects the history of the school's relationship with the student. With it, both the school staff and parents can do a better job of managing their children's education. The technology adds a new set of problems but it helps the teaching staff to operate on a more professional plane. If you are willing to deal with the consequences of more individualized instruction and greater accountability, you should pursue this type of program.

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